

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 June 2001 (14.06.2001)

PCT

(10) International Publication Number  
**WO 01/43123 A2**

(51) International Patent Classification<sup>7</sup>: **G11B 7/00**

(21) International Application Number: **PCT/GB00/04719**

(22) International Filing Date:  
11 December 2000 (11.12.2000)

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:  
9929003.3 9 December 1999 (09.12.1999) **GB**

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EE, EE (utility model), ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

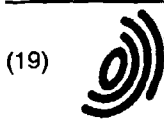
— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/43123 A2

(54) Title: **IMPROVED RECORDABLE COMPACT DISK WRITING AND PLAYING APPARATUS**

(57) Abstract: Recordable compact disc player and media. Improved power consumption, aerodynamics and use of data compression allow large quantities of music to be stored and played back. Storage space is increased by recording information on the land and grooves of 8 cm recordable media. Aerodynamic guide vanes are provided on the disc enclosure interior and the discs are textured for improved aerodynamic performance. A play list and play list is browser is further provided and media can also be visibly labelled whilst written, providing a storage device with a visible fingerprint or identifier characteristic of the owner.



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 1 065 658 A1**

(12)

# EUROPEAN PATENT APPLICATION

published in accordance with Art. 158(3) EPC

(43) Date of publication:  
03.01.2001 Bulletin 2001/01

(21) Application number: 99906494.2

(22) Date of filing: 26.02.1999

(51) Int. Cl.<sup>7</sup>: **G11B 7/00**, G11B 7/135,  
G03H 1/22, G03H 1/26,  
G11C 13/04

(86) International application number:  
PCT/JP99/00896

(87) International publication number:  
WO 99/44195 (02.09.1999 Gazette 1999/35)

(84) Designated Contracting States:  
DE FI FR GB NL

(30) Priority: 27.02.1998 JP 4675498  
08.05.1998 JP 14232198  
08.05.1998 JP 14232298  
08.05.1998 JP 14232398

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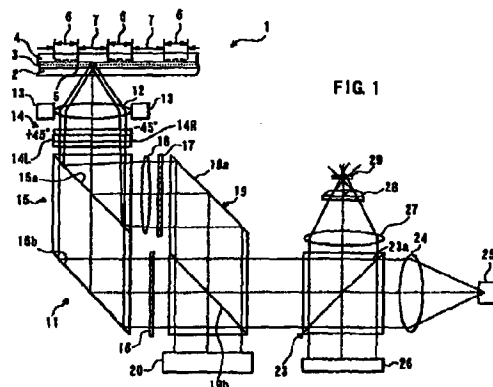
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## (54) METHOD AND APPARATUS FOR OPTICAL INFORMATION, METHOD AND APPARATUS FOR REPRODUCING OPTICAL INFORMATION, APPARATUS FOR RECORDING/REPRODUCING OPTICAL INFORMATION, AND OPTICAL INFORMATION RECORDING MEDIUM

(57) The present invention makes it possible to reduce the size of an optical system for multiplex recording or reproduction of information utilizing holography.

A pick-up (11) of an optical information recording/reproducing apparatus generates information light by spatially modulating laser light emitted by a light source device (25) with a spatial light modulator (18) depending on the information to be recorded and generates reference light for recording having a spatially modulated phase by spatially modulating the phase of laser beam emitted by the light source device (25) with a phase-spatial light modulator (17). The information light and the reference light for recording are projected upon an optical information recording medium (1) such that they converge in different positions, and information is recorded in the hologram layer (3) in the form of an interference pattern as a result of interference between the information light reflected by a reflecting film (5) and the reference light for recording. The positioning of the information light and the reference light for recording is carried out based on information recorded in address servo areas (6).



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US005578415A

**United States Patent** [19]

Hayashi et al.

[11] Patent Number: **5,578,415**[45] Date of Patent: **Nov. 26, 1996**[54] **OPTICAL RECORDING MATERIALS,  
METHOD FOR PREPARING THE SAME AND  
OPTICAL CARDS HAVING THE SAME**[75] Inventors: **Yoshio Hayashi; Shuichiro Ogawa;  
Junichi Iwata, all of Shizuoka-ken,  
Japan**[73] Assignee: **Asahi Kasei Kogyo Kabushiki Kaisha,  
Osaka, Japan**[21] Appl. No.: **188,743**[22] Filed: **Jan. 31, 1994****Related U.S. Application Data**[63] Continuation of Ser. No. 726,739, Jul. 2, 1991, abandoned,  
which is a continuation of Ser. No. 404,586, Sep. 8, 1989,  
abandoned.**[30] Foreign Application Priority Data**

Sep. 12, 1988	[JP]	Japan	63-226448
Nov. 24, 1988	[JP]	Japan	63-294656
Dec. 9, 1988	[JP]	Japan	63-310059
Dec. 14, 1988	[JP]	Japan	63-313681
Dec. 14, 1988	[JP]	Japan	63-313682
Dec. 14, 1988	[JP]	Japan	63-313683
Dec. 15, 1988	[JP]	Japan	63-314984
Feb. 16, 1989	[JP]	Japan	1-35038
Feb. 16, 1989	[JP]	Japan	1-35039
Feb. 17, 1989	[JP]	Japan	1-36312
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Jun. 2, 1989	[JP]	Japan	1-139252
Jun. 5, 1989	[JP]	Japan	1-141172
Jun. 12, 1989	[JP]	Japan	1-146794
Aug. 15, 1989	[JP]	Japan	1-209536

[51] Int. Cl.<sup>6</sup> ..... **G03C 8/28; G11B 7/24**[52] U.S. Cl. .... **430/270.11; 430/945; 430/964;  
430/247; 430/248; 430/417; 283/74; 283/77;  
283/85; 346/135.1**[58] Field of Search ..... 430/247-249,  
430/353, 350, 349, 626, 945, 495, 954,  
417, 232, 617, 270.11; 283/74, 77, 85;  
346/135.1; 369/284, 288**[56] References Cited****U.S. PATENT DOCUMENTS**

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(M-216) [1261] (May 20, 1983).*Primary Examiner*—Martin J. Angebrannndt*Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch,  
LLP**[57] ABSTRACT**

An optical recording material comprising: a thin film or membrane of a hydrophobic binding agent; and metallic particles having a diameter of 0.003  $\mu\text{m}$  to 3  $\mu\text{m}$  dispersed in said film or membrane wherein the density of said metallic particles is higher near at least one surface of said film or membrane as compared with another portion of said film or membrane, each metallic particle having a nucleus and an outer coating, said outer coating consisting of at least one metal having a melting point of 250° C. to 1800° C. and a thermal conductivity at 0° C. of 5  $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  to 450  $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  wherein the reflectivity of the surface of said film or membrane where the density of said metallic particle is higher is 10 to 90%, a method for preparing the optical recording material and an optical card containing the optical recording material.

**40 Claims, 8 Drawing Sheets**